

Appendix 2 Information for Primary Care

This is a short summary of the full statement, which must be consulted when more detail is required.

Background

A medical emergency occurs in around 1 in 600 flights or 1 in 30,000 passengers. Respiratory illnesses comprise around 12% of in-flight emergencies. Other emergencies include syncope, chest pain, stroke, and cardiac arrest.

Although air travel appears generally safe for passengers with significant respiratory disease previously assessed by a lung specialist, a decision to undertake air travel cannot always be taken lightly. Diverted flights incur significant expense and inconvenience, and a patient who deteriorates in mid-air can pose huge challenges to airline crew and other passengers. As well as noting the passenger's respiratory condition and significant co-morbidities, a decision regarding suitability for air travel should consider flight duration, destination (especially if at altitude or subject to extreme weather conditions), usual equipment and medications, and whether equipment will operate effectively and safely at altitude.

Who should be referred for further assessment?

In general, similar considerations apply to adults and children if they have severe chronic airway disease, or require long term supplementary oxygen, or non-invasive or tracheostomy ventilation.

Experts generally advise pre-assessment or screening for the following adults, children, and infants:

- a. Those with a respiratory condition with the potential to deteriorate acutely resulting in incapacitation and/or the need for medical intervention. This includes (but is not exclusive to):
 - i. Severe ($FEV_1 < 50\%$ predicted), or poorly controlled obstructive airway disease (usually asthma or COPD), evidenced by symptoms, a requirement for domiciliary oxygen, severe and/or frequent exacerbations
 - ii. Symptomatic restrictive lung or chest wall conditions, or known respiratory muscle weakness causing breathlessness and exercise limitation
 - iii. Pulmonary hypertension
 - iv. Co-morbid conditions which may be worsened by hypoxaemia (cerebrovascular or cardiac disease)
 - v. Recent (< 6 weeks) hospital treatment for a respiratory condition

- vi. Requirement for CPAP or ventilatory support such as NIV (for example those with Obstructive Sleep Apnoea and Neuromuscular conditions)
 - vii. Active cancer with lung involvement
 - viii. Patients already requiring domiciliary oxygen
- b. Recent (< 6 weeks) pneumothorax and those at higher risk of pneumothorax (cystic lung disease or recurrent pneumothoraces), and patients with trapped lung and a chronic air space
 - c. Recent (< 6 weeks) pulmonary embolus or deep venous thrombosis, or increased risk of venous thromboembolism (VTE)
 - d. Anyone who has experienced significant symptoms during previous air travel, or whose condition is of concern to their physician

The following are generally considered contra-indications to air travel:

- a. Untreated ventilatory failure
- b. Untreated pneumothorax
- c. Respiratory infection representing a risk to others e.g., TB, SARS, MERS
- d. Bronchogenic cysts. Cerebral air embolism, in some cases fatal, has been reported in aircraft passengers after rupture of a bronchogenic cyst

Thoracic surgery

At least two UK centres independently advise against non-essential air travel for 4 weeks after removal of drains. If air travel is essential, a minimum delay of 2 weeks is advised, depending on the type of surgery and the surgeon's advice.

Other interventional procedures (pleural procedures, percutaneous lung biopsies, bronchoscopy)

If there is any doubt about the safety of air travel post-procedure, the clinician and/or team involved should be consulted.

Upper respiratory tract infections

- Passengers who develop significant sinus barotrauma after flying can be offered short-term topical and oral decongestants, as well as appropriate analgesia.
- Symptoms and signs of barotrauma should have resolved before flying once more. This usually takes between one and six weeks.
- After an episode of acute otitis media, it is usually recommended that patients should not fly for two weeks.

Respiratory infections

- Patients with highly contagious infections including measles, chickenpox, mumps, SARS-CoV 2, or MERS should not be allowed to travel until they are considered non-infectious.
- Patients with TB should consult the specialist team prior to flying to ensure they are not contagious.
- Patients undergoing chemotherapy should not travel while they are at increased risk of infection or suffering from significant side-effects, such as vomiting. They should consult their specialist team for advice.

Initial assessment

Pulse oximetry is the easiest and usually first screening test. It has generally been accepted in the past that those with resting SpO₂ >95% at sea level should not require in-flight oxygen. More recent research has also suggested checking that SpO₂ remains above 84% on a six minute walk test in those with severe disease. Historically, those able to walk 50 m without distress have been considered to have sufficient cardiopulmonary reserve to fly, but current data suggest this measure is an insensitive assessment of “fitness to fly. It is still sometimes referenced by airlines and aviation authorities.

Tests by specialist colleagues

Specialist colleagues may undertake more comprehensive clinical assessment and testing; and may proceed to a hypoxic challenge test (HCT). HCT is performed using an inspired gas mixture containing 15% oxygen, which gives an approximately similar inspired oxygen tension (PO₂) to breathing air at the maximum allowable cabin pressure altitude (2438 m or 8000 ft). HCT is usually performed in a specialist respiratory unit.

Other practical points

- Hypoxaemia and increased ventilatory demand from exertion while flying may challenge those already approaching the limits of their respiratory reserve. It therefore seems prudent to recommend that passengers with significant respiratory limitation, regardless of whether travelling with in-flight oxygen, should request an aisle seat near a toilet to avoid long periods of walking.
- Passengers should keep active by undertaking seat-based exercises and/or standing at intervals if flight conditions permit. Patients who cannot tolerate withdrawal of supplemental oxygen for even a short period of time should not travel by air, as there will be periods of time when oxygen cannot be supplied.

- All medications and spacer devices should be carried in hand luggage to mitigate the risk of missing hold baggage and be accessible
- Individuals prescribed adrenaline auto-injectors should have these to hand

Summary

Those with stable respiratory disease without a history of air travel intolerance, resting hypoxaemia at sea level or significant cardiac comorbidity, are unlikely to need in-flight oxygen. Attention should be paid to those with more severe lung disease or those who have had unstable disease or recent acute events, including pneumothorax, pulmonary embolus, or infection. Specialist involvement may be required for this group.